

Claims:

1. An injection device comprising:

a housing having a proximate end and a distal end, the distal end

5 having an opening therein;

a cartridge barrel within the housing, the cartridge barrel having proximate and distal ends;

a needle cannula fixed to the distal end of the cartridge barrel, or attachment means for fixing a needle cannula to the distal end;

10 a stopper within the cartridge barrel;

a driver coupled to the stopper;

a shield coupled to the housing and slidable between a retracted and an extended position;

shield driver means activateable to urge the shield from the withdrawn

15 position to the extended position; and

sensor means moveable with said driver and in slidable contact with an exterior surface of said cartridge barrel or an interior surface of said housing, the sensor means arranged to detect an end profile of the barrel or housing and to trigger activation of the shield driver means upon detection.

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2. A device according to claim 1, wherein the shield driver means comprises a coil spring within which the cartridge barrel is located.

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3. A device according to claim 2, the shield driver means comprising a release mechanism for fixing the spring relative to the driver in a compressed state, the release mechanism being actuatable by said sensor means to release the spring.

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4. A device according to any one of the preceding claims, wherein the driver is arranged to be manually pushed through the housing, the driver carrying the shield driver means to a shield activation point.

5. A device according to claim 4 when appended to claim 3, the coil spring being fixed at its proximal end to the driver, and the spring release mechanism fixing the spring to the driver at its distal end.

5 6. A device according to any one of claims 1 to 3, the shield driver means additionally providing a driving force for said driver.

7. A device according to claim 6 when appended to claim 3, the coil spring being fixed at its proximal end to the housing, and the spring release mechanism fixing the spring to the driver at its distal end.

10 8. A device according to any one of the preceding claims, the sensor means comprising one or more deformable arms attached or formed integrally with the driver.

15 9. A device according to claim 8, the or each arm being biased against the exterior surface of the cartridge barrel and arranged to follow the surface profile of the barrel.

20 10. A device according to claim 8 or 9 when appended to claim 3, the release mechanism comprising a catch provided on a radially outer surface of the or each deformable arm.

25 11. A device according to any one of the preceding claims, said driver and said sensor means being a single molded plastics element.

12. An injection device comprising:

a cartridge barrel, said barrel arranged to contain a stopper and fluid therein, a needle cannula having a sharp distal end and a second open end, the fluid in communication with said needle second end, said barrel having a second open end and a second end having a radial flange adjacent to the second end;

30 a housing surrounding said barrel, said housing having a distal open end adjacent to the needle and a proximate end having a flange receiving the

radial flange of the barrel;

a shield releaseably restrained by the housing, said housing and said shield arranged in a sliding relationship with the shield positioned primarily within the housing until release;

5 a driver, said driver positioned partially within said housing, said driver equipped with at least one deformable side arm sensing the end of the barrel, said driver slidingly located within said housing for moving the stopper forward; and

10 a biasing spring, said biasing spring further adapted to bias the shield to shield the needle after the driver sensor detects the end of the barrel.

13. The safety syringe of claim 12, wherein the biasing spring is carried by the driver and is released to bias the shield when the end of barrel is reached.

15 14. The safety syringe of claim 12 or 13, wherein the driver has two sensor elements to detect the end of the barrel.

15. The safety syringe of any one of claims 12 to 14, wherein said the housing and shield are equipped with latches.

20 16. The safety syringe of claim 15, wherein said latches prevent premature release of the shield.

25 17. The safety syringe of claim 15, wherein said the latches retain the shield in the needle shielded position.

18. The safety syringe of claim 1, wherein said the driver is deformable during assembly.